

PATENT  
Attorney Docket No. 401585/BRAUN

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

ULRICH JOOS

Application No. Unassigned

Filed: March 14, 2002

For: SCREW-TYPE INTRAOSSEOUS  
DENTAL IMPLANT

Art Unit: Unassigned

Examiner: Unassigned

**PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT**

1. A dental implant comprising:
  - a) a bottommost implant tip located at an apex;
  - b) a root part which extends to the implant tip (1), is intended to be fitted in a jawbone, and has a parabolic outer contour with the implant tip as vertex;
  - c) an implant neck adjoining the root part, which extends in the coronal direction and is intended to lie inside the gingiva; and
  - d) an outer thread provided on the root part, wherein
    - e) the root part has the parabolic outer contour along its entire length ( $l_{\max}$ ) and as far as a theoretical ridge line at which it adjoins the implant neck.
2. The dental implant as claimed in claim 1, wherein
  - a) the outer thread provided on the root part has an outer contour extending parallel to the parabolic outer contour of the root part, and
  - b) ends at a distance of 1 mm to 4 mm from the ridge line.
3. The dental implant as claimed in claim 1, wherein
  - a) the root part at the ridge line has a maximum radius ( $r_{\max}$ ) extending in the radial x-direction;
  - b) the parabolic outer contour, placed in a cartesian system of x-y coordinates, with the implant tip positioned at the origin, follows the equation  $l_y = K \cdot 4r_x^2$ , where
  - c)  $l_y$  represents the respective ordinate value and  $r_x$  represents the associated abscissa value; and
  - d) the constant (K) results from the equation:  

$$K = l_{\max} : 4r_{\max}^2.$$

4. The dental implant as claimed in claim 3, wherein the maximum radius ( $r_{\max}$ ) is between 1 mm and 3 mm,
5. The dental implant as claimed in claim 1, wherein
  - a) the outer thread is self-cutting;
  - b) the length ( $l_{\max}$ ) of the root part correlates with a pitch (S) of the outer thread;
  - c) the outer thread ends at a distance, in the range of from 1 mm to 4 mm, from the ridge line; with
  - d) the distance being greater as the length ( $l_{\max}$ ) of the root part increases.
6. The dental implant as claimed in claim 5, wherein the length ( $l_{\max}$ ) of the root part and the pitch (S) of the outer thread, given a maximum radius ( $r_{\max}$ ) = 2 mm, correlate with one another as follows:

Length ( $l_{\max}$ ) of root part (2) [mm]	Pitch (S) [mm]
6	0.65
8	1
10	1
14	1
16	1

7. The dental implant as claimed in claim 1, wherein the outer thread includes thread teeth,
  - a) the thread teeth at the root part extend in the y- direction, and have a height ( $g_h$ ) of about 0.3 mm; and
  - b) the thread teeth in the x-direction, have a length ( $g_l$ ) in the range of from 0.25 mm to 0.5 mm.
8. The dental implant as claimed in claim 7, wherein
  - a) the maximum radius is 2 mm;
  - b) the length ( $g_l$ ) of the thread teeth decreases as the length ( $l_{\max}$ ) of the root part (2) increases; and
  - c) the outer thread with its thread teeth has the following values:

Length ( $l_{\max}$ ) of root part [mm]	Height ( $g_h$ ) of thread teeth [mm]	Length ( $g_l$ ) of thread teeth [mm]
6	0.3	0.4
8	0.3	0.4
10	0.3	0.3
14	0.3	0.25
16	0.3	0.25

9. The dental implant as claimed in claim 1, wherein
- a) the implant is made of biocompatible material; and
  - b) the root part has a rough surface which is plasma-coated or ceramic-coated or is treated chemically, electrochemically, mechanically or by laser.

10. The dental implant as claimed in claim 1, wherein the implant neck
- a) is made of titanium, a titanium-based alloy or another biocompatible metal or its alloy and is polished; or
  - b) is coated with ceramic, glass ceramic, ceramic-like material, hydroxyapatite, plastic or metal.

11. The dental implant as claimed in claim 1, wherein
- a) measured in the y-direction, the implant neck has a height (h) in the range of from 1 mm to 3 mm; and
  - b) the implant neck is cylindrical or is widened or narrowed in a trumpet shape or conically in the coronal direction.

12. The dental implant as claimed in claim 4, wherein the maximum radius is from about 1.5 mm to about 2 mm.

13. The dental implant as claimed in claim 9, wherein the biocompatible material comprises titanium-based alloys, metals, metal alloys, ceramic, glass ceramic, ceramic-like material or plastic.